Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Reliability and Continuity of Communications Networks, Including Broadband Technologies	)	PS Docket No. 11-60
	)	
Effects on Broadband Communications Networks of Damage or Failure of Network Equipment or Severe Overload	)	PS Docket No. 10-92
	)	
Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks	)	EB Docket No. 06-119

COMMENTS OF THE UTILITIES TELECOM COUNCIL

The Utilities Telecom Council (UTC) hereby files its comments in response to the Commission's *Notice of Inquiry* in the above-referenced matter.[1] UTC supports the Commission's effort to conduct a "comprehensive examination of issues regarding the reliability, resiliency, and continuity of communications networks, including broadband technologies."[2] As the Commission recognizes, "power companies and other utilities use communications services for their operations and to deploy energy-efficient technologies," and "power companies are looking to broadband technologies as they begin to deploy Smart Grid."[3] Moreover, "critical infrastructure providers, such as power companies, must have reliable communications services to aid in their own repair and restoration efforts."[4] Thus, it is appropriate that the Commission "establish a dialog with all interested stakeholders, including … critical infrastructure providers, such as utility companies," on a broad range of issues regarding the reliability and resiliency of our Nation's communications networks, particularly as they migrate from legacy wireline systems to broadband technologies, "which may or may not be built to the high carrier grade

[1] *Reliability and Continuity of Commercial Networks, Including Broadband Technologies*, Notice of Inquiry, PS Docket No. 11-60, 26 F.C.C.R. 5614 (2011)("*NOI*").

[2] *Id.* at ¶2.

[3] *Id.* at ¶4.

[4] *Id.* at ¶5.

standards of legacy wireline systems."[5]

As UTC has previously commented, utilities and other critical infrastructure industries (CII) are concerned about the capability of carrier networks to meet utility standards for communications reliability.[6] That is one of the main reasons why utilities rely on their own private internal communications networks, even though they do use commercial communications networks to meet some of their communications needs. Reliability and resiliency are essential functions of a utility-grade network, and utilities design, build, operate and maintain their private internal networks to standards that often exceed those of commercial communications networks. As UTC explained in its previously-filed comments, utilities typically require 72 hours or more of back-up power at their wireless sites, and they need networks with extremely low-latency and ubiquitous coverage that are available during emergencies, as well as normal operations.[7] By contrast, carrier networks lack adequate back-up power at their cell sites and capacity to handle increased traffic during emergencies, and they typically do not provide the kind of coverage into remote areas, backhaul redundancy or SLAs that utilities and other CII need to cover emergency scenarios, as well as routine operations.[8]

These shortcomings are widely recognized. For example, even NSTAC acknowledged that "[t]hese backup capabilities, which are not economical or feasible for commercial networks, are required by utilities to ensure reliable communications in an emergency."[9] In addition, the FCC has recognized in this proceeding that there is a litany of other issues, including: equipment reliability, protocol issues, capacity issues, cascading overloads/graceful system recovery, maintenance procedures, single points of

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[5] *Id.* at ¶3.

[6] Comments of The Utilities Telecom Council in PS. Docket No. 10-92 at 2 (filed June 25, 2010).

[7] *Id.* at 3-4 (stating that many utilities report that as much as 40% of their service territories are unserved by carriers and that carriers have refused to build-out their networks in order to support smart grid deployments). *See also* Comments of The Utilities Telecom Council in PS Docket No. 10-92 at 2-4 (countering claims by AT&T regarding back-up power, coverage, priority access/restoration, and SLAs).

[8] *Id.*

[9] *See* NSTAC Report to the President on Telecommunications and Electric Power Interdependencies: People and Processes: Current State of Telecommunications and Electric Power Interdependencies, Jan. 31, 2006, at 3-1 and 3-2. The report is reprinted in the following compilation of reports http://www.ncs.gov/nstac/reports/2006/NSTAC_XXIX_Reports_082206.pdf.

failure, and silent failures.[10] These issues exacerbate existing concerns among utilities about the reliability and resiliency of commercial networks in general, and some of these issues create new concerns, particularly as commercial systems migrate to broadband technologies.

The question is whether commercial service providers will recognize these shortcomings, or whether they will deny them, as they did in earlier comments in this proceeding. As NASUCA observed, a common theme running through the comments by commercial service providers was "essentially 'our networks are fine, so there is no need for regulation.'"[11] The reality is that commercial service providers will design their networks for reliability to the extent that it is feasible and the costs can be economically justified.[12] For example, commercial service providers do not provide coverage into areas that cannot be served economically and cost-effectively, and have told utilities that they won't serve those areas unless utilities bear the costs of doing so. Similarly, wireless providers may *engineer* their networks with backup power, but that does not mean each cell site actually has uninterruptable backup power because it may be cost-prohibitive to do that for a commercial network. As such, there are fundamental differences between the degree of reliability of a commercial network and the reliability of a utility network that cannot – and should not – be ignored or glossed over.

To their credit, some commercial service providers have reached out to address utilities' concerns about the reliability of commercial networks. For example, Verizon sponsored a landmark study by UTC, "A Study of Utility Communications Needs: Key Factors that Impact Utility Communications Networks", which found among other things that commercial service providers have increased opportunities in utility communications but must meet utilities' key reliability, technical, and cost requirements.[13] This is the kind of dialog that would be productive in this proceeding. Thus, UTC looks

[10] *NOI* at ¶¶30-41.

[11] Reply Comments of the National Association of State Utility Consumer Advocates at 2 (filed Sept. 7, 2010), *citing* Comments of AT&T at ii, iii; Comments of Comcast Corporation ("Comcast") at 4-16; MetroPCS Comments at 2; Comments of Sprint Nextel Corporation ("Sprint") at 2; Verizon Comments at 2-5 (filed June 25, 2010).

[12] *See e.g.* Comments of Qwest at iii (filed June 25, 2010)(stating that "[b]roadband networks are designed to be redundant where feasible and the cost to provide redundancy is economically justified.")

[13] Utilities Telecom Council, "A Study of Utility Communications Needs: Key Factors that Impact Utility

forward to working with commercial service providers and with the Commission going forward to address the issues facing utility use of commercial networks.

Finally, it must be emphasized that utilities will continue to rely on private internal networks for mission critical applications, even though they may use commercial services to meet some of their communications needs. Moreover, utilities will still need access to spectrum to meet their communications needs, notwithstanding improvements in the reliability of commercial networks. As such, the Commission should continue to promote the development and deployment of utility networks by providing utilities access to spectrum, while also promoting the use of commercial networks by improving their reliability and resiliency.

I. Introduction

UTC is the international trade association for the telecommunications and information technology interests of electric, gas and water utilities, pipeline companies and other critical infrastructure industries. Its members include large investor-owned utilities that serve millions of customers across multi-state service territories to relatively smaller municipal and cooperative utilities that may serve thousands of customers in isolated towns, cities and rural areas of the country. In addition, UTC is allied with the all of the major electric, gas and water utility associations, as well as other organizations representing various other critical infrastructure industries – as part of its Critical Infrastructure Communications Coalition.

All of UTC's members own, manage or control extensive communications systems to support the safe, reliable and efficient delivery of essential services to the public at large. Due to the critical nature of these communications systems, they are designed, built and operated to demanding standards that exceed those of commercial communications systems for coverage, availability and survivability. Utilities need ubiquitous coverage all across their service territories, including remote areas that tend to be underserved or unserved by commercial carriers. They also need communications systems that do not become

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Communications Networks," (Sept. 2010) available at http://www.utc.org/utc/utility-communications-needs-key-factors-impact-utility-communications-networks-september-2010.

unavailable due to traffic congestion, particularly during emergency scenarios when utilities need reliable communications the most. Finally, their networks need to be able to survive natural and manmade disasters; so they have extended power back-up and they are built to withstand high winds and heavy ice. As such, utility networks are built for reliability; which sets them apart from commercial systems that are designed for capacity.

Although they rely on their own private internal networks, utilities and other CII also use carrier networks for communications to support the delivery of their essential services to the public at large. These communications include leased lines and wireless communications. Utilities use commercial networks where they lack coverage on their own private networks or for certain targeted applications. As they deploy smart grid, some utilities have turned to carriers to meet their needs for communications for certain applications, such as advanced metering. Thus far, utility use of carrier networks for smart grid has been limited, and part of the reason is that utilities do have concerns about the capability of carrier networks to meet utility standards for communications reliability. As such, UTC is pleased that the FCC has provided this opportunity to raise these concerns in this proceeding.

II. Utilities and Other CII Need Communications Networks that Meet Their Functional Requirements.

A. Continuity of Service Issues

The Commission asks a series of questions regarding continuity of service, including factors such as access to wireless facilities and flooding as well as standards and best practices that have an impact on the ability to maintain or restore communications operations during emergencies. Specifically, the Commission identifies backup power and backhaul redundancy as two issues for particular focus with regard to continuity of service. Moreover, it inquires how backup power techniques or performance standards could or should be employed, and whether and what minimum standards should apply, taking into account potential challenges to deploying backup power solutions. Similarly, it inquires about the relative advantages and disadvantages of different backhaul technologies, as well as the relative resiliency

and reliability characteristics of different backhaul technologies in different emergency situations.[14]

As noted above, if commercial service providers want to provide service to utilities and other CII they must meet their functional requirements, including backup power and network redundancy/diverse routing. Different utilities and CII will have different requirements depending on a number of factors, including the service area and the applications supported. Similarly, they encounter many of the same challenges that face commercial service providers with regard to access to wireless facilities and flooding. As such, utility communications networks are not standardized, but they must be engineered and operated to meet the utilities' performance requirements for safety and reliability so that the networks remain operational, despite challenges such as access to wireless facilities and flooding.

In July 2010, the Department of Energy conducted its own request for information into the communications needs of utilities, and the comments by utilities and equipment providers in that proceeding are instructive for the FCC's proceeding here. As PEPCO explained,

> A key attribute of utility communications has always been its ability to be resilient during the worst condition as well as being tailoring to our unique business needs. When storms occur, our systems need to communicate. A carrier can claim and demonstrate extremely high average levels of reliability, but if their communications do not work during the fraction of seconds needed by utilities during abnormal system conditions (i.e., during storms & regional events), reliability, stability and performance of our systems and applications suffer as well as the success of Smart Grid.[15]

Similarly, Southern California Edison stated that,

> Telco networks built for the mass consumer market often lack the reliability needed for core Utility applications such as voice dispatch or SCADA. For example, whereas Utility base station sites have several weeks of emergency power backup, Telco cell sites have only hours (or days at most) of power backup. In addition to limited power backups, they have little or no redundancy, reducing the overall reliability.[16]

These comments reflect the fact that there are fundamental differences between utility and carrier

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[14] *NOI* at ¶¶15-25.

[15] Comments of PEPCO Holdings, Inc. to the Department of Energy in response to its request for information on the communications needs of utilities (filed July 12, 2011) , available at http://www.gc.energy.gov/documents/Pepco_Comments_CommsReqs.pdf.

[16] Comments of Southern California Edison to the Department of Energy in response to its request for information on the communications needs of utilities (filed July 12, 2101), available at http://www.gc.energy.gov/documents/SouthernCAEdison_Comments_CommsReqs.pdf.

networks when it comes to reliability in general and with respect to specific issues such as backup power and backhaul redundancy that affect continuity of service.[17]

Because different utilities have different functional requirements depending on a variety of factors including service territory and smart grid applications, UTC refrains from recommending any particular minimum standards with regard to backup power, nor does it make any assessment of the relative advantages and disadvantages of different backhaul technologies at this time. Instead, UTC urges commercial service providers and the FCC to work together with utilities and CII to develop systems that ensure continuity of service generally. As the Commission recognizes, it would be difficult to implement such requirements and they may not be appropriate in all cases.[18] Ultimately, utilities and CII will consider using services from commercial service providers to the extent that their networks meet utility and CII communications requirements.

B. Reliability and Resiliency Issues

a. Overview

The Commission asks a series of questions regarding reliability and resiliency, centered around issues associated with the migration from circuit-switched networks to IP networks. The FCC recognizes that at the same time that this technological convergence is occurring on commercial networks, that "three major industry sectors are converging on ever more extensive use of broadband technologies: public safety, commercial communications, and utilities."[19] The FCC also recognizes that the "potential for a

[17] Equipment providers as well as utilities have filed comments on the record at the Department of Energy that distinguish between mission critical and other communications needs when it comes to using commercial services. See e.g. Comments of Alcatel-Lucent; Comments of Motorola; Comments of GE Digital Energy; Comments of Hughes Network Systems; Comments of On-Ramp Wireless, Inc.; Comments of Silver Springs Networks, Inc. and Comments of Tropos Networks. See also Comments of Avista Corporation; Comments of Baltimore Gas & Electric Company; Comments of Florida Power and Light Company; Comments of Great River Energy; Comments of Pepco Holdings, Inc.; Comments of Oncor Electric Delivery Company; and Comments of Southern Company Services, Inc.

[18] *See e.g. NOI* at ¶23 (asking whether minimum backup power requirements should be uniform or different and what factors the FCC should consider, such as the criteria for which sites require backup power and what areas of the country must meet duration and level of quality of service requirements). *See also NOI* at ¶26 (asking "How can the Commission ensure backhaul redundancy across multiple providers and companies when many communications service providers lease backhaul facilities from other companies?")

[19] *NOI* at ¶¶27-28.

decline in service reliability and resiliency" due to the transition to IP is a "source of concern for critical sectors such as public safety, energy, and finance as well as for the general public."[20] In response, the Commission generally asks whether it should establish performance goals, and invites comment on the "benefits and disadvantages of various approaches to ensuring reliable and resilient service."[21] More specifically, the Commission inquires into issues with regard to equipment reliability, protocol issues, capacity issues, cascading overloads and graceful system recovery, maintenance procedures, single points of failure and silent failures.[22]

Generally, utilities share the Commission's concerns about the level of reliability and resiliency of commercial service provider networks. However, there should not be an inherent reliability or resiliency issue with the use of IP technologies. Instead, infrastructure issues such as capacity issues, single points of failure in the network or silent failures would seem to pose a greater risk to reliability or resiliency. In fact, NERC has specifically advised utilities to ensure the use of redundant communications, including when they rely on third-party service providers.[23] This NERC advisory was issued after "a registered entity [i.e. a utility] had communications interrupted during maintenance work as a result of their redundant communications providers subcontracting their back-up systems to a common third-party provider."[24]

b. Specific Issues

In response to the kind of specific issues raised by the FCC surrounding reliability and resiliency, UTC again refers the Commission to the comments that were filed on the record in the Department of Energy's RFI on the communications needs of utilities.[25] Some of the common issues cited by utilities include the failure of commercial service providers to meet latency, coverage and network availability

[20] *Id.*

[21] *Id.*

[22] *Id.* at ¶¶30-41.

[23] North American Electric Reliability Corporation, "Lesson Learned: Telecommunications — Redundant Communications" (May 20, 2010) available at http://www.nerc.com/files/LL-Redundant-Comms.pdf

[24] *Id.*

[25] *Supra* n. 15-17.

requirements, which tend to be much more stringent than the standards that are used by commercial service providers.[26] Generally, these comments underscore the issues regarding reliability and resiliency that commercial service providers and the FCC should work to address in order to meet utility communications needs.

Several case studies illustrate the kind of real-world reliability and resiliency issues that utilities have experienced using commercial service providers. For example, DTE Energy described "two incidents that highlight the improvements that carriers are going to need to make before their networks are suitable to utility use."[27] DTE stated that during the August 2003 blackout, "[s]ubstations connected by our private networks stayed in communication with system operators for hours or days longer than those connected by telephone company leased lines," thus requiring "much more manual intervention in the restoration process, slowing down and complicating and already difficult situation."[28] DTE concluded that "[h]ad the telephone companies provided adequate emergency power facilities, the leased lines would have been available to use throughout the blackout."[29] The second incident occurred in 2008 when a Detroit area cellular switching office was taken offline for 12 hours during a power outage caused by a winter storm. During this time, DTE Energy lost connectivity to several thousand smart meters installed in a pilot program, computerized dispatching for field crews and general cell phone communications. Meter data integrity, crew productivity and customer service were all negatively impacted during this

[26] *See e.g.* Comments of San Diego Gas & Electric in response to the Department of Energy's Request for Information on the communications needs of utilities at 23 (July 12, 2010) available at http://www.gc.energy.gov/documents/SDGE_Comments_CommsReqs.pdf. (comparing utility requirements to carrier network standards). *See also* Comments of Southern California Electric in response to the Department of Energy's Request for Information on the communications needs of utilities at 6 (July 12, 2010) available at http://www.gc.energy.gov/documents/SouthernCAEdison_Comments_CommsReqs.pdf (providing a list of issues regarding carrier networks, including latency and network availability). *See also* Comments of Southern Company Services in response to the Department of Energy's Request for Information on the communications needs of utilities at 26-28 (July 12, 2010) available at http://www.gc.energy.gov/documents/SouthernCompany_Comments_CommsReqs.pdf. (also criticizing service level agreements for failure to guarantee adequate performance, particularly during emergencies).

[27] Comments of DTE Energy in response to the Department of Energy's Request for Information on the communications needs of utilities at 8 (July 12, 2010) available at http://www.gc.energy.gov/documents/DTEEnergy_Comments_CommsReqs.pdf.

[28] *Id.*

[29] *Id.*

event. Once again DTE concluded that, had the carrier provided adequate back-up power, this problem would have been averted.[30]

Florida Power and Light recounted similar reliability problems using carrier networks. Faced with a significant investment to update aging private voice and data networks, FPL piloted commercial push-to-talk service with field crews in 1998. After an extensive 6-month pilot, all participants agreed that the commercial service was not a viable alternative to FPL's private system:

- Commercial carrier depended on public electric service and could not provide reliable service during electric service disruption.
- Commercial carrier could not provide consistent and sufficient radio coverage throughout the FPL service territory.

FPL confirmed this conclusion during the 2004 and 2005 hurricane restoration work. FPL private radio was consistently the most robust and reliable service throughout the devastated areas. Where FPL relied on commercial carriers to coordinate contractors and suppliers, FPL experienced significant variations in service levels; as the restoration efforts proceeded – a carrier would perform adequately one day, then experience extended outage and capacity overloads the following day.[31]

CONCLUSION

In conclusion, UTC appreciates the opportunity to provide these comments in response to the Commission's inquiry into the reliability and continuity of commercial communications networks, including broadband technologies. As UTC has explained herein, utilities continue to have concerns about using commercial service providers to support smart grid and other applications. These concerns are real and should be addressed. Otherwise, utilities will not use commercial service providers or they will only use them for certain applications that are not mission critical. UTC looks forward to working with the commercial service providers to develop solutions to these issues, and it supports the

[30] *Id*.

[31] Comments of Florida Power and Light in response to the Department of Energy's Request for Information on the communications needs of utilities at 22 (July 12, 2010) available at http://www.gc.energy.gov/documents/FloridaPowerLight_Comments_CommsReqs.pdf.

Commission's effort to address these issues as well. Finally, the Commission should not force utilities to use commercial service providers; instead it should allow utilities the ability to choose between private internal networks and commercial service providers as appropriate. In that regard, the Commission should continue to promote the development of private internal communications networks by providing access to spectrum, as UTC has advocated in numerous other proceedings.

Respectfully submitted,

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